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CORONA SEEN AT ECLIPSE INDICATES SUN ACTIVE

The various expeditions of astronomers from the United States to Sumatra to observe the total solar eclipse of Jan. 14 were generally successful.

In a special cable to Science Service, Dr. John A. Miller, leader of the Swarthmore College Eclipse Expedition located at Benkoelen, Sumatra, reported:

"We observed the eclipse of the sun this afternoon through a sky thinly clouded. We believe, however, that our plates are not seriously affected, except possibly those made with the Einstein camera to test the deflection of star light near the sun. The corona was of the type usually associated with maximum sun spot activity and some very large prominenceswere visible."

Capt. F. B. Littell, in charge of the party from the U. S. Naval Observatory, sent word that the sky was partly clear at Tebbinge-Tinggi, where the navalastronomers were located. Dr. Harlan T. Stetson, of Harvard University reported to the Harvard Observatory that his observations were made through thin clouds but were partially successful. The Harvard party, including also Dr. W. W. Coblentz, of the U. S. Bureau of Standards, was located on the west coast of Sumatra, not far from the Swarthmore College expedition, at Benkoelen,. Months of study of the observations and photographs made will be necessary before definite results of the expeditions can be announced, however.

The regular round shape of the sun's corona as observed at this eclipse is, according to Dr. Louis A. Bauer, director, department of terrestial magnetism, Carnegie Institution of Washington, what was to be expected because of the great number of spots that have appeared recently on the face of the sun. Between eclipses the shape of the corona can not be determined because the filmy pearly radiance haloing the sun can be seen from earth only during the time of total eclipse.

The number of spots visible on the sun at any one time varies in a period of about eleven years and the minimum of the present cycle occurred in 1922. However, the great activity of the sun in the last few months, as shown by the number of spots indicates, according to Dr. Bauer, that the maximum will occur either this year or next, an unusually short time having elapsed between minimum and maximum. One very large spot which moved across the face of the sun and disappeared at the end of December with the solar rotation would have been on the edge if it had survived. This might well have caused the large prominences or red flames of hydrogen reported by Dr. Miller, Dr. Bauer said.

DR. MILLER RECEIVES $1,000 AMERICAN ASSOCIATION PRIZE.

The award of the $1000 prize of the American Association for the Advancement of Science to Dr. Dayton C. Miller, Case School of Applied Sciences, Cleveland, is a recognition of patience, perservance and service to science as well as an acknowledgment that the results of Dr. Miller's work may require serious changes in the prevalent idea of the way the universe is put together.

The observations made in the course of the ether drift experiments during 1925 consisted of over 100,000 separate readings, a procedure that required Dr. Miller to walk, in the dark, in a small circle, for a total distance of 100 miles, while making at very frequent intervals the most delicate measurements possible.

Dr. Miller said in his prize paper: "I think I am not egotistical, but am merely stating a fact when it is remarked that the ether drift observations are the most trying and fatiguing, as regards physical, mental and nervous strain, of any scientific work with which I am acquainted."

That the results reported in the paper that the judges decided was the most notable contribution among the thousand papers of the Kansas City meeting, will have a far-reaching effect on the foundations of physics and astronomy can not be doubted. Dr. Miller repeated the experiment that is fundamental to the Einstein theory and found that the accepted interpretation of the famous Michelson-Morley experiment of 1887 must be reversed. There is an ether drift, the earth does carry along with it through space some of the ether, whereas the Einstein theory was built upon the assumption and the results of the 1887 experiment that showed no such drift.

Either the Einstein theory must be modified to meet the new facts, or if such modificationisimpossible, it must be scrapped. When Dr. Miller announced preliminary results at the April meeting of the National Academy of Sciences, Einstein acknowledged that the data if confirmed would be a serious blow to his theory in its present mathematical formulation. Physicists do not believe, however, that results of Dr. Miller are impossible of reconcilation with a theory of relativity that is worked out upon new assumptions and facts.

That the earth and the solar system is speeding through space at the rate of 125 miles a second or more, ten times the speed previously suspected, was also revealed by Dr. Miller's experiments. Prof. F. R. Moulton of Chicago during the meeting explained that this high velocity may mean in part that our own stellar galaxy or universe is rushing through the ether. If so, the astronomers may be revising some of their ideas of the composition of the universe.

Dr. Miller began his experiments on ether drift thirty years ago. Soon he will again journey to Mount Wilson to repeat the experiments once more. Such is the method of science; the rewards are an inspiration to mankind.

SCIENTISTS URGE WHITE INDIAN RESERVATION

Interest in the White Indians of the Darien region of Panama was revived by a resolution passed by the governing Council of the American Association for the Advancement of Science at Kansas City. Because of the great anthropological and genetic interest that attaches to these strange people, and to the Tule or San Blas nation of Indians of whom they form a part, the Council invited the attention of the United States government to the advisability of using its good offices with the government of the Republic of Panama to secure for the Indians a permanent reservation made up of their own ancestral lands, where they may be secure from commercial exploitation and from the danger of destructive infusions of low-caste mixed white and negro blood.

Future meeting places of the Association were also announced by the Council. A year hence the scientists will gather in Philadelphia, in 1927 in Nashville, Tenn., and in 1928 in New York. Tentative plans were laid for meetings in Des Moines, Iowa, in 1929, in Cleveland, Ohio in 1930 and in New Orleans in 1931.

GERMS TOO SMALL TO FILTER CAUSE MANY ANIMAL DISEASES

Elusive, ultramicroscopic forms of life, minute as those which cause smallpox, scarlet fever, sleeping sickness, and other diseases in human beings, are responsible for many of the diseases of animals, which cause an inestimable loss each year to farmers of every country.

Dr. Hubert Bunyea, avian pathologist of the U. S. Department of Agriculture, reported to the Washington branch of the Society of American Bacteriologists on the work that has been done in the control and eradication of these diseases in the United States and other countries. Rabies, foot-and-mouth disease, hog cholera, fowl pest, and bird pox, he said, are outstanding examples.

While the economic losses due to rabies are not as great as some, it is a very prevalent disease. All mammals, including man, are susceptible to it. It exists among the predatory animals of the Northwest, and this adds to its economic as well as its public health aspect.

The disease has been deprived of much of its horror by the discovery of Pasteur that animals and people could be rendered immune by repeated treatment with weakened doses of the virus. But the process is complicated and costly, and efforts to simplify it and make it practical for every day use as a preventive in the case of domestic animals, have not yet been entirely satisfactory, Dr. Bunyea said.

Another germ too small for the microscope to disclose with ordinary light rays, is the one that causes the foot-and-mouth disease and which has recently been made the subject of intensive investigation. This disease infects cloven-footed animals and is very contagious. The U. S. Bureau of Animal Industry has a commission investigating this subject in Europe. The bureau opposes the importation of any foreign viruses to this country, even for scientific study, in fear of their spreading and prefers to study them where the diseases occur.

Hog cholera, which once nearly annihilated the swine industry in many parts of the country, is also due to a virus of the extremely small kind. The actual organism is still unknown, although a serum with protective power has been in use for years. The organism not only passes through filters that retain ordinary

bacteria, but it cannot be grown in test tubes in the laboratory.

Fowl pest is also caused by ultramicroscopic bacteria. It existed in the United States last year, and is believed to have been spread from a sample of virus brought into the United States for study at one of the large eastern universities. Prompt measures eradicated the disease.

The organisms of fowl pest are very resistant under certain conditions and can survive for at least seven months in artificially stored blood. Fowls are more susceptible to their own special diseases than mammals and man are to theirs. Their semi-wild nature prevents their easy isolation and individual treatment, while their habit of flocking allows infection to spread rapidly.

The ultramicroscope, which uses X-rays instead of ordinary light, and can see what the ordinary microscope fails to reveal, has already been employed in the study of the minute forms of life that cause various animal diseases. So far the results have been only partially successful but research of this sort has just begun, and the possibilities are unlimited, Dr. Bunyea said.

RADIATOR ALCOHOL DISSOLVES AUTOMOBILE LACQUER

Alcohol is a splendid lacquer solvent. Many automobile owners whose cars are finished with fine lacquers are discovering this to their sorrow. With enamels and varnishes these owners have not taken care to keep the alcohol for their anti-freeze radiator solution off the car finish. The spotting which resulted was negligible with these older forms of car finish, but with the new lacquers the results are disastrous.

Auto owners are warned by dealers selling automobiles that are finished with lacquer against allowing any form of alcohol to splash on these surfaces. In fact they must be careful that the vapor from a boiling radiator does not drift back over the engine hood. Because of these facts several builders of high-class automobiles are now recommending against any form of alcohol for antifreeze use. Instead they recommend using glycerine or ethylene glycol solutions.

Anti-freeze solutions made from glycerine or ethylene glycol have other advantages too. From the standpoint of the automobile owner perhaps the most important is the fact that if they are accidentally spilled or boil over onto the lacquered surface no serious harm is done. The research laboratory of the largest manufacturer of moderate and high priced automobiles in the world has made a careful study of this situation, and the subsidiary corporations are issuing corresponding information to their dealers and distributors throughout the country.

COAL COMPOSITION REVEALS OIL AND GAS

The possibility of striking oil and gas in any locality is indicated by the composition of the coal found in that region, according to studies of Illinois coals by G. F. Moulton of the Illinois Geological Survey. The ratio of the fixed carbon to the total combustible matter, as determined by analysis of the coal, affords the petroleum prospector a scientific index to the probable presence and the depth of oil and gas accumulations in underlying strata.

The report issued by the Survey shows that in areas of high carbon ratios the lowest stratum with possibilities of oil production is shallow and limited to the later Paleozoic rocks, while in areas of low carbon ratios the lowest stratum with such possibilities lies deeper and includes the older Paleozoic formations as well as those of later origin. The coals mined in Illinois were found to have a fixed carbon content varying from 49 - 63 per cent of the total combustible matter, while most of the oil production is from areas with carbon ratios lying between 54 and 57 per cent.

The explanation of this relationship between the composition of the coal and the presence of petroleum is found in the metamorphic changes brought about by heat and pressure to which the deposits are subjected. Geologists have recognized for some time that the degree to which rocks have been metamorphosed is a factor affecting the accumulation of economically important pools of gas and oil.

Metamorphism causes chemical and physical changes in the material from which the oil is derived and probably brings about the transformation. It enhances the circulation of fluids through the rock strata, thereby promoting the accumulation of deposits of economic importance. It alters the nature of the reservoir-rock, sometimes making it unsuitable for efficient retention of oil. Finally, it changes the character of the oil after its formation and, if carried to the extreme scatters any accumulation and destroys its value.

The same conditions of heat and pressure which thus affect the accumulation of oil change the composition of the coal, and these changes, as expressed by the carbon ratio, were found to be closely related to the oil possibilities. The study of the petroleum-producing regions of Illinois shows that in areas where the carbon ratios are above 60 per cent., the oil and gas possibilities are poor, while the lower the ratios the greater the probability of large accumulations.

COLOR MOVIES COMING IN VOGUE

Black and white motionpictures, now so popular, may soon be superseded almost completely by films taken and produced throughout in natural colors, judging by the activity of several companies.

Slapstick comedies will doubtless continue to appear in drab monochrome for some time, but in feature photography the large conservative Hollywood producers are now capitulating to the demand for color. At least a part of several major screen dramas now in preparation will revel in chromatic glory.

With the aid of super-illumination much in excess of the usual studio requirement, the photographer now takes two films of the same scene simultaneously through a single lens. One of these responds only to green light, and is finished as a green transparency. The second, recording only red, is finished in red. The two films, pasted back to back in exact register, are ready for the exhibitor. There is no photographic deposit of metallic silver as in the case of the ordinary black and white picture.

Artists, accustomed to a whole galaxy of pigments, can hardly believe that red and green alone can yield such accuracy and variety in shade. Sky tints; anything you wish in leaf, tree-trunk or earth shades; every possible hair and flesh tint, and even the regal effects of warm black plush and golden satin are faithfully and beautifully recorded. Pure lemon yellow, cobalt blue and the pure purple shades are not available, however - at least not until some three-color process is perfected. Unfortunately there are only two sides of a film, so that the third color doesn't knowwhere to go. These shortcomings, nevertheless, are not noticed by the cinema patron, who spends most of his time appraising the flesh tints anyway!

The color of film costs several times the figure for black and white. However, when even the cheapest comedies cost five dollars per second/ of theater exhibition time, or in other words five dollars per foot of film, the added expense does not rate high when compared to other costs. Unlike the hand-tinted films of previous years, the new films may be duplicated in positive indefinitely without continued repetition of the great initial cost.

ARABIA MAY BE MOTHER OF FIRST CIVILIZATION

Arab faces in the tented town of Jabrin, an oasis in southern Arabia, which have a fleeting resemblance to features on prehistoric sculpture in Mesopotamia, may be a clue to the birthplace of civilization.

O.G.S. Crawford of the British Ordnance Survey, in the forthcoming issue of the Geographical Review, pieces the story of civilization on earth which is told by fragments of art and industry of the ancient races of Mesopotamia, India, and Egypt.

Remains of the oldest civilized race known, the Sumerians, were found in Mesopotamia a year ago. A contemporary inscription of a king who had been thought to be only mythical, and a masterpiece of art, consisting of a carved frieze of cattle being milked, were among the discoveries. The inscription is now the earliest dated historical document in the world, and is believed to have been made about 3500 years before Christ.

But on the sites where these ancient remains were found, are traces of a still older race which left nothing behind it but painted pottery and arrowheads.

"This race of neolithic people later disappeared," Mr. Crawford explains, "and they did not plant the seeds of an enduring civilization. It seems certain they came to the well watered plains of the Tigris and Euphrates from the north,

where possibly the climate of Persia was getting drier. In these remoteages, nearer perhaps to the Ice Age than we are to these people, increasing dryness, unlike today, would make Mesopotamia more inhabitable than less.

"This uncivilized race was replaced by the Sumerians who brought with them two epoch-making inventions, copper and writing, and also domestic animals, unknown to the earlier inhabitants. But the origin of the Sumerians is shrouded in mystery.

"In what land did they first learn to write, mine copper andmake copper implements and build ships? When they emigrated from their own land and first brought their arts to the valley of the Tigris and the Euphrates, most of Europe was still in the Stone Age."

Their peculiar mode of dress, a short skirt that left most of the body naked, indicated that they did not come from the colder regions of the north, Mr. Crawford believes. That they did not come from India or obtain their civilization from there is shown by relics of races recently unearthed in the valley of the Indus from beneath more recent ruins dating from the third century before Christ. These ruins beneath ruins are remains of brick buildings of the Copper Age. Inscribed seals like those found on early Babylonian sites were unearthed there.

Either the Sumerians came from India or else some of them went to India at the same time that others went to Mesopotamia, Mr. Crawford believes. Both the Indian and Sumerian script were highly conventionalized and developed, and neither seems to have been derived from the other. If the Indian script resembled the earliest pictorial writing of Sumeria, it might have been possible to believe that the Sumerians came fron India.

The Asiatic influence in ancient Egyptian art and industry which has been recognized for a long time, was believed to have come from Mesopotamia, In Egypt, history goes back to about 3500 years before Christ. Before this time there was a long prehistoric civilization, which, according to archeological findings, falls into three more or less distinct periods.

The last period, just before the dawn of history, is characterized by pottery often decorated with ships and in a style which resembles somewhat the early Sumerian, The similarity is more in character than in subject matter. Much other evidence exists showing connections between the Egyptian and Mesopotamian civilizations, such as brick building and cylindrical inscribed seals. A design of a long-legged bird standing on an un-Egyptian ship pecking at a fish appears on two prehistoric Egyptian vases.

"The Sumerians who brought their civilization to the valley of the Tigris and Euphrates, apparently came from the south," Mr. Crawford said, "but not from India. Is it possible to find a common source for both the Sumerians and what has always been thought a direct Mesopotamian influence on Egypt?

"Were the Sumerians driven from some barren region of southern Arabia by a cause similar to that which at an earlier period had driven the people who painted pottery and used arrowheads from the land of the Tigris and the Euphrates? Did some of these Sumerian nomads settle in the valley of the two rivers and others in the valley of the Nile?

"It is quite probable that the Sumerians once inhabited some part of Arabia, and there is hardly any other place from which they could have come. Deserts must have become drier since the Ice Age. A relatively slight decrease in rainfall would be enough to turn habitable grassy plains into deserts and drive the wanderers to the well-watered valleys.

"Such causes may also have operated in Africa. They may have caused the first peopling of Egypt and the gradual driving back of the Stone Age folk along the western margin of Europe. They may have driven the Central Asiatic nomads down to the plains of China.

"There is no new direct evidence of an early Sumerian civilization in southern Arabia, but it is one of the few remaining regions of the world not yet explored," Mr. Crawford continued. "No archeological excavations have been made there, and except for one or two reconnaissances, no European traveller has ever been there.

"It is possible that mounds such as have recently been discovered in India exist there. Major R. E. Cheesman, the latest traveller who has penetrated into southern Arabia, visited Jabrin and made some interesting observations on the Al Murra, a race of people now inhabiting that oasis.

"They live entirely in tents; they speak Arabic, but only in addition to their native tongue, and until two years before his visit they were pagans,' Major Cheesman said. 'The Al Murra type of face reminds me of the features to be seen on early Sumerian sculptures. It is not unreasonable to suppose that they are the remnants of this, the earliest civilization, left unchanged and unaffected by the passing of nations in the fastnesses of their desert stronghold.'"

BRAINS MORE USEFUL THAN BEEF IN SPORTS

The most valuable gift a baseball or football player can have isn't extraordinary strength or endurance or even speed. All of these won't keep him in the spotlight of fame if he lacks brains, according to tests being made by Dr. C. H. Bean, psychologist at the University of Louisiana.

The quality which Red Grange, Illinois football star, regards as most important in his success really comes second, said Dr. Bean. This quality has been described as "the perceiving of motion of several men in terms of a player's own motion, so that he knows where all of them will be when he himself reaches a desired position."

"But intelligence is so important in this," explains Dr. Bean, "that if intelligence is left out,-as it can be by mathematical calculation, the mere speed of reaction to a situation is secondary."

Muscular strength and endurance rank third among the factors of success thus far measured, and weight or "beef" is fourth.

All this is true for such sports as football, baseball, and basketball, but when it comes to track and field events intelligence becomes less vital and

physical qualities take a rise in value, the tests indicate.

Dr. Bean is making a job analysis of athletics in order to find out definitely what makes one man a star in sports and another a dub. He also hopes to show to what extent athletic training develops those factors which are most needed in practical life. Results shown by the scientific tests of speed, intelligence, endurance, strength, and judgement are being compared with the ratings given to the athletes by their instructors and coaches.

In order to measure the speed with which different athletes respond to a situation, a special piece of apparatus has been devised. A series of pictures is shown to the athlete, and as soon as he sees each one and recognizes its meaning, he is expected to take a leap. If he would like to experience what he sees in the picture he leaps forward, but if he would dislike it he is expected to leap back.

STUDY OF APE-MIND HINDERED BY APE SHORTAGE

Finding out what a chimpanzee thinks about it proving a slow and difficult task for psychologists, not because the chimpanzee doesn't think, but because there are so few apes available for scientific observation.

"If stories of killing that come to us from the native homes of higher apes may be believed, there is real danger that the source of supply of apes used in psychological investigations may be entirely wiped out before many years have passed," is the statement made by Dr. H. C. Bingham, of the Institute of Psychology at Yale University, where four chimpanzees are being studied.

"A colony of fifteen anthropoid apes, such as we studied in Havana last year, is one of the rarest in modern animal collections," said Dr. Bingham. "Most of us are fortunate if we have one or two such animals for laboratory study. And for a single scientist to observe all types of the higher apes through all stages of development is, in the present state of our scientific resources, utterly impossible."

Dr. Bingham, who recently addressed the American Psychological Association, has urged that psychologists carefully standardize their methods of studying apes and make their experiments scientifically precise, because of this shortage of subjects. Such precision is necessary to make the isolated observations comparable.

"The investigator in ape psychology is working with extraordinary animals and with something new in behavior turning up every few minutes one is inclined to seek amusement with, rather than knowledge about, his subject," he points out.

Study of the higher apes which are more like man than any other animal is expected to shed light on the development of mental processes. Dr. Bingham states that tests devised in the study of the anthropoid apes should be of great assistance in measuring the mentality of primitive races.

AMERICAN UNIVERSITY OPENS INTERNATIONAL FISH SCHOOL

The University of Washington is to be an international center of the United States and Canadian fisheries research work on the Pacific coast, according to announcement from Dean John N. Cobb, of the College of Fisheries. The International Fisheries Commission, composed of official state fisheries commissions of Pacific coast states, Alaska, and British Columbia, together with the entire Canadian department of fisheries, will consolidate all work here. The university was selected especially because of its proximity to the halibut and salmon supply. Eighteen leading fisheries scientists will locate here, among them William S. Thompson of the California state fisheries and Dr. H. F. Rich of Washington, D. C.

TABLOID BOOK REVIEW

CONSTELLATION CHARTS, by S. G. Barton and W. H. Barton, a series of twelve charts, each 18 inches in diameter, accompanied by sixteen pages of descriptive matter, Philadelphia, 1925. For sale by S. G. Barton, 26 North Millick St., Philadelphia, or Eastern Science Supply Co, Box 1414, Boston, Mass; $2.75.

To the student of the stars, whether amateur or professional, it has always been a source of regret that there has not been available any really satisfactory constellation charts, which would actually show the stars as they appear in the sky. Though many sets of charts have been published, and planispheres, designed to show the aspect of the heavens at any time, have been invented, they have all suffered from at least one disadvantage. A star but slightly within the limits of naked eye visibility has invariably been shown when near the horizon just the same as when it was at the zenith, even though the absorption of the atmosphere for the low altitude is actually enough to make it invisible. This has led not only to an unreal appearance of the skies, but has unduly crowded such maps.

Prof. S. G. Barton, who is in charge of the Flower Observatory of the University of Pennsylvania, has naturally recognized this defect, and in the present series of charts it has been corrected for the first time. The brightnesses of the stars, takenfrom the Harvard Revised Photometry, the standard authority for stellar magnitudes, have been represented by seven different symbols, and atmospheric absorption at low altitudes has been calculated and allowed for, with the result that the charts show the sky for each month as it actually appears to the eye.

By means of a most happy collaboration with Mr. W. H. Barton, an engineer of considerable ability, the execution of the charts, which has taken several years, is most excellent in every way, and they may be heartily recommended to anyone who wishes to know the constellations, as well as to those who already maintain a speaking acquaintance.